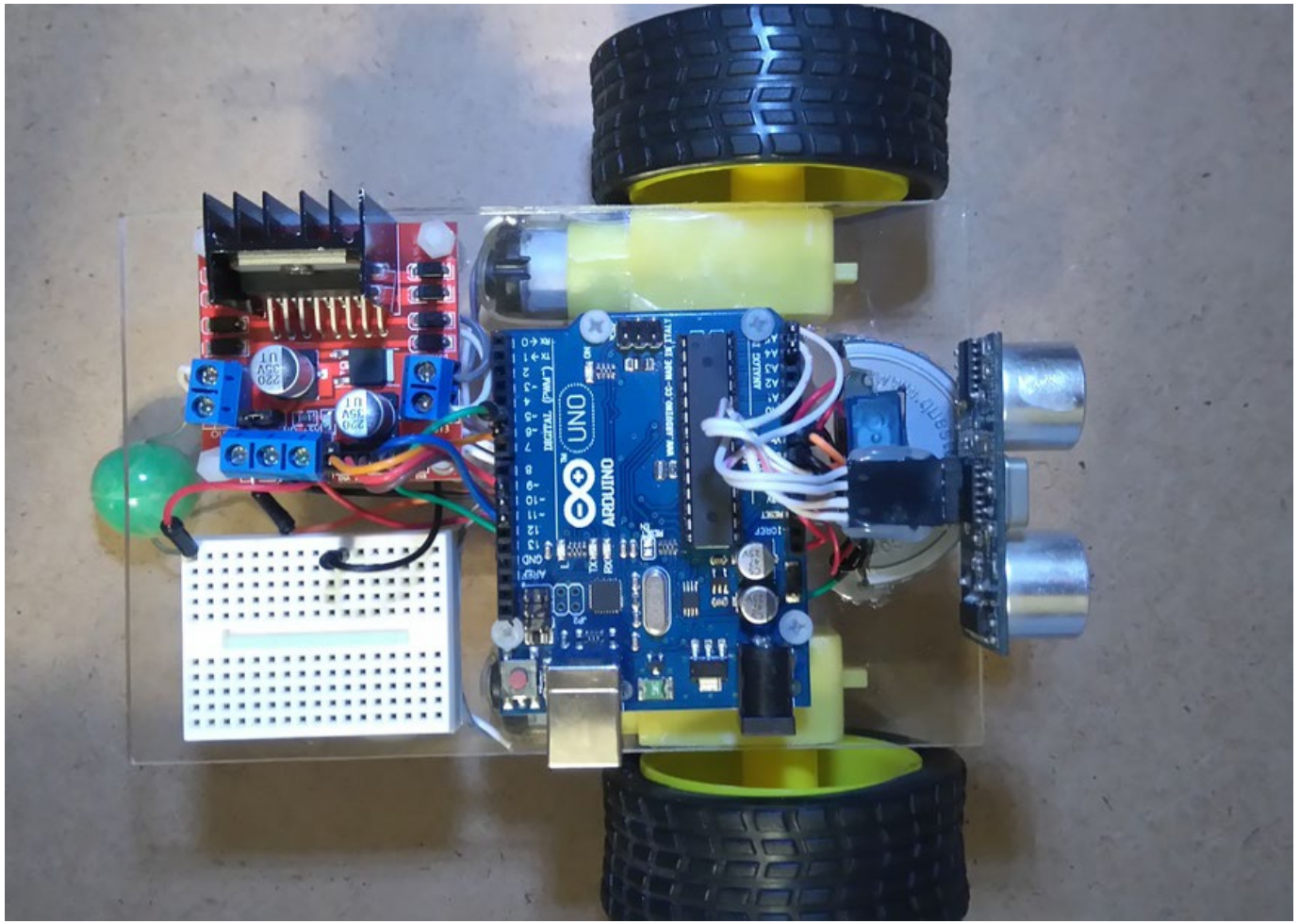
PROJECT No - 04
OBSTACLE AVOIDING ROBOT USING L298N MOTOR CONTROLLER

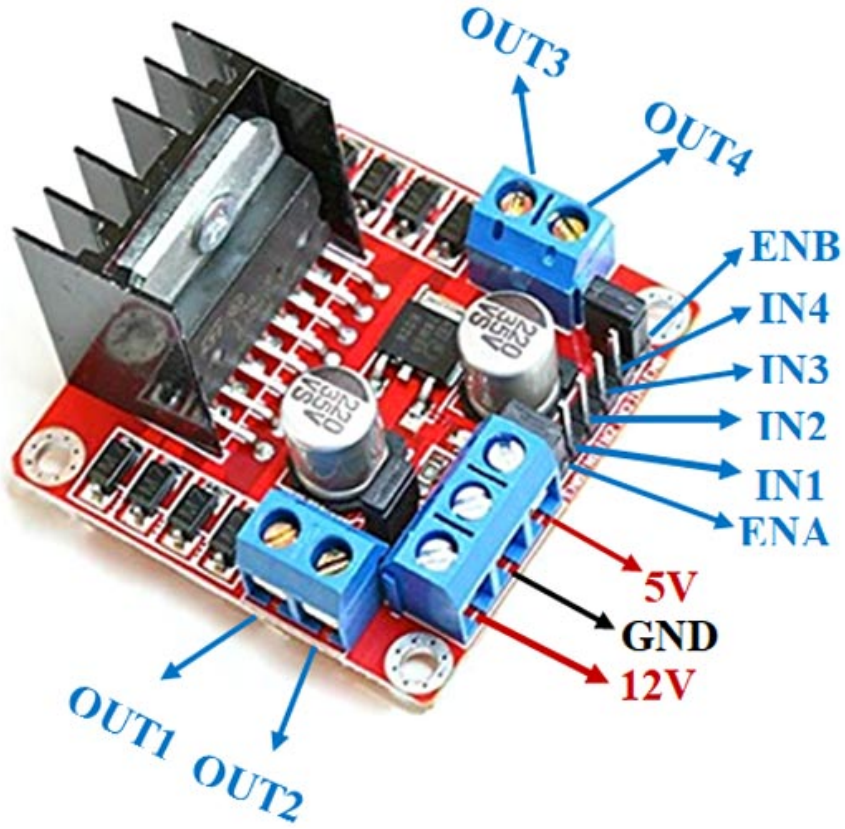
MOBILE ROBOTICS SYSTEMS



Components

- Arduino
- Jumper Wires (Male - Male & Male -Female)
- Bread Board
- L298N Motor Controller
- Gear Motors (DC Motors) X 2 or X 4
- Car Chassis or Flat Plate
- Free Wheel
- Battery 9V or 12V (Rechargeable)
- Ultrasonic Sensor - Obstacle Avoiding Robot

L298N MOTOR CONTROLLER



L298N MOTOR CONTROLLER TABLE

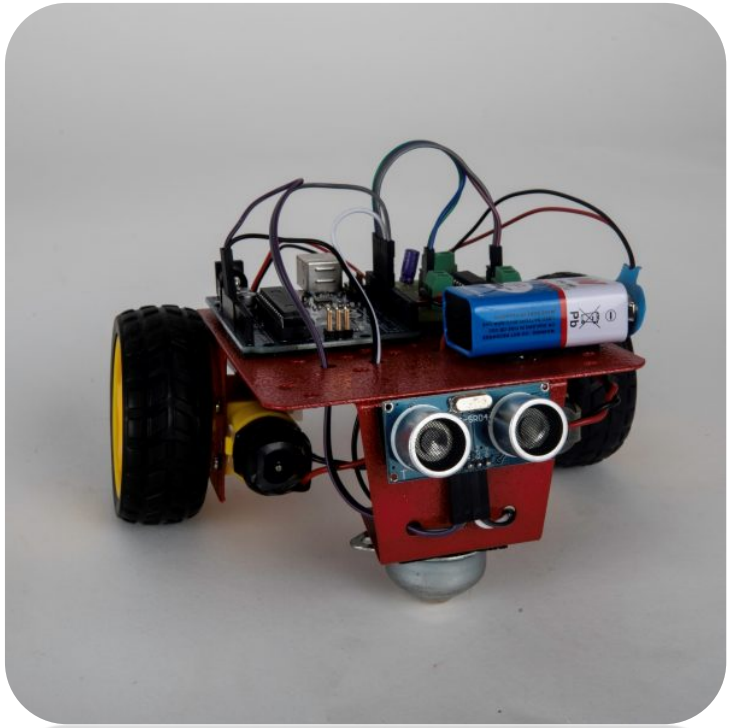
Operation	Description	Input 1	Input 2	Input 3	Input 4
Move Forward	Both Motors should rotate in forward direction	HIGH	LOW	HIGH	LOW
Move Backward	Both Motors should rotate in backward direction	LOW	HIGH	LOW	HIGH
Turn Right	Left motor should rotate in forward direction while the right motor is stopped.	HIGH	LOW	LOW	LOW
Turn Left	Right motor should rotate in forward direction while the left motor is stopped.	LOW	LOW	HIGH	LOW
Stop	Both motors should be stopped.	LOW	LOW	LOW	LOW

OBSTACLE AVOIDING ROBOT

Aim: Design an Obstacle Avoiding Robot

Objectives:

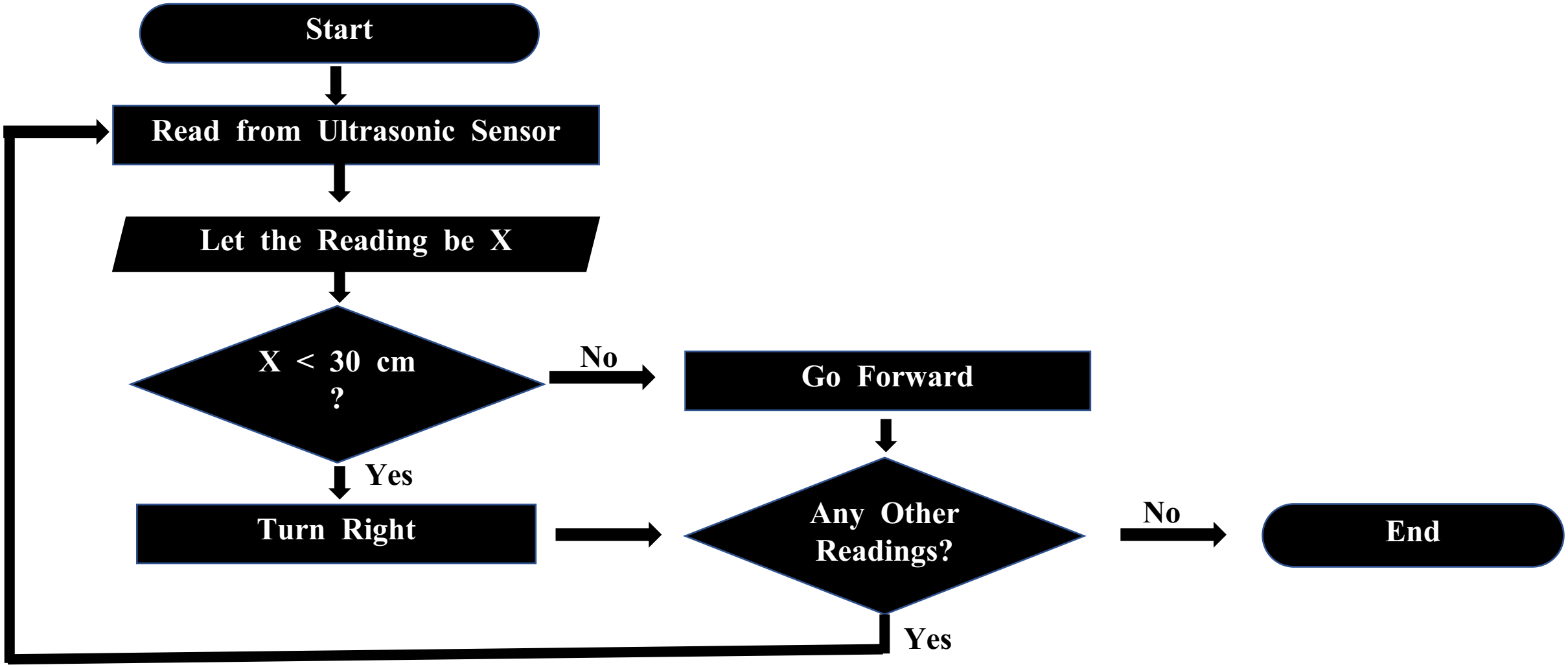
- **If Ultrasonic Sensor detects any object within 30 cm the robot should turn right.**
- **If the Ultrasonic Sensor doesn't detect any object within 30 cm the Robot should move forward (Because: No obstacles are there.)**



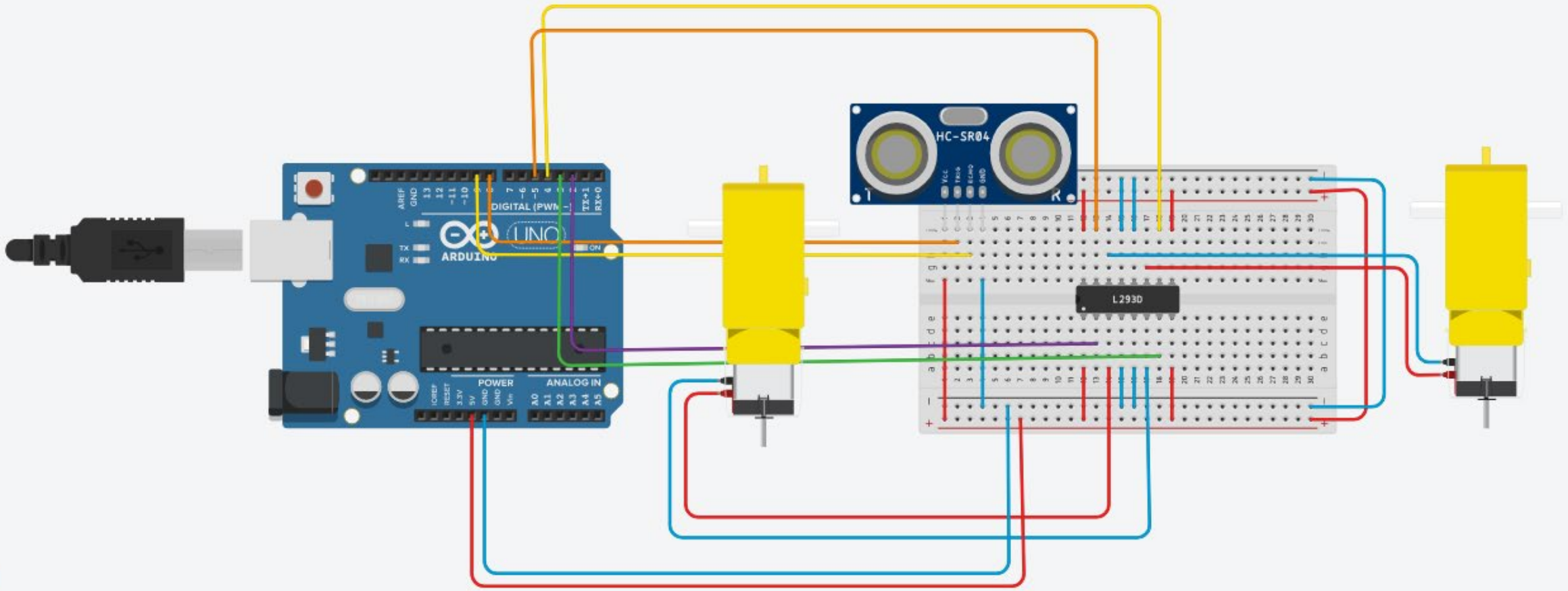
Steps:

1. **Make the Flow Chart for Line Following Robot.**
2. **Design the Circuit in Tinker CAD.**
3. **Develop the Program in Scratch.**
4. **Generate C++ Code.**
5. **Make the Actual Robot.**
6. **Upload the code to Arduino.**

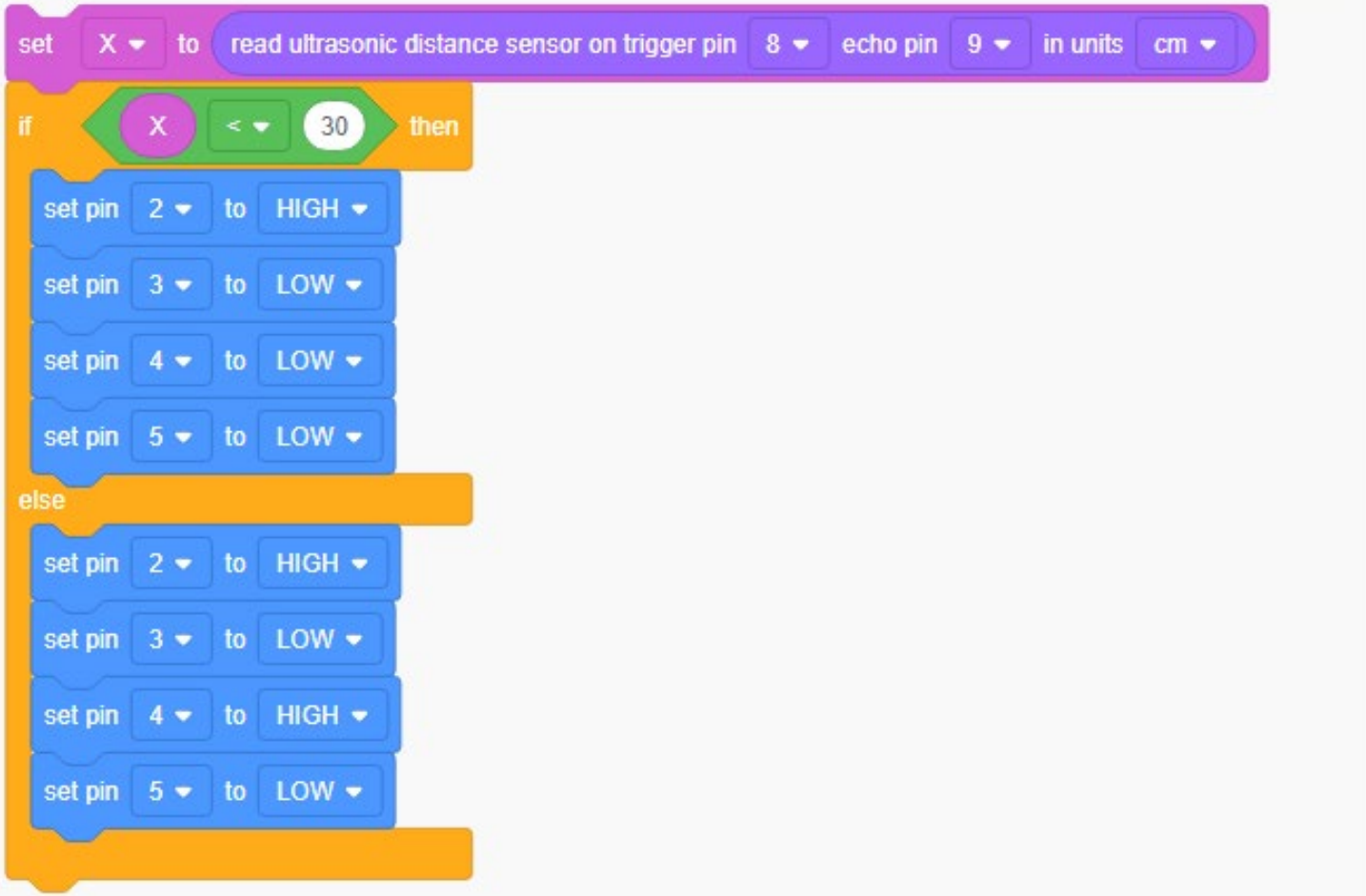
OBSTACLE AVOIDING ROBOT - FLOWCHART



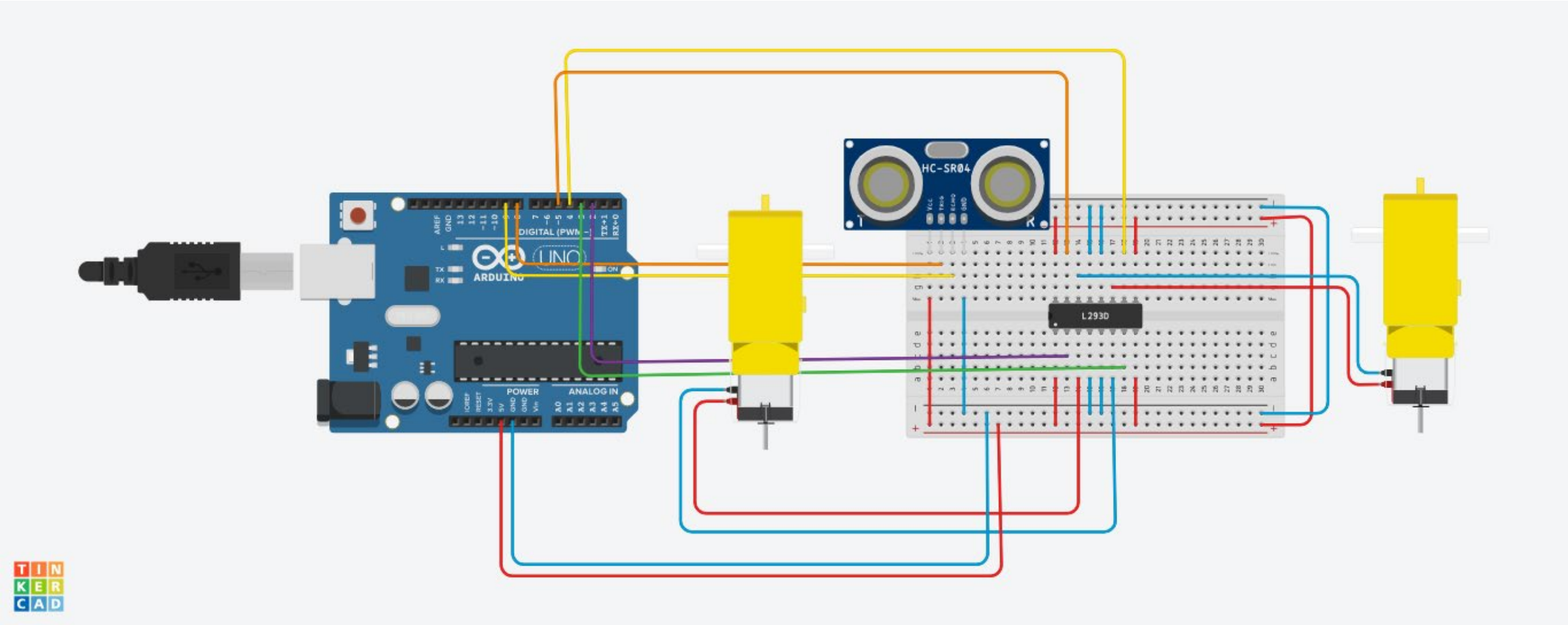
OBSTACLE AVOIDING ROBOT WITHOUT SPEED CONTROL WITHOUT ACCURATE TURNING [SIMPLIFIED ROBOT]



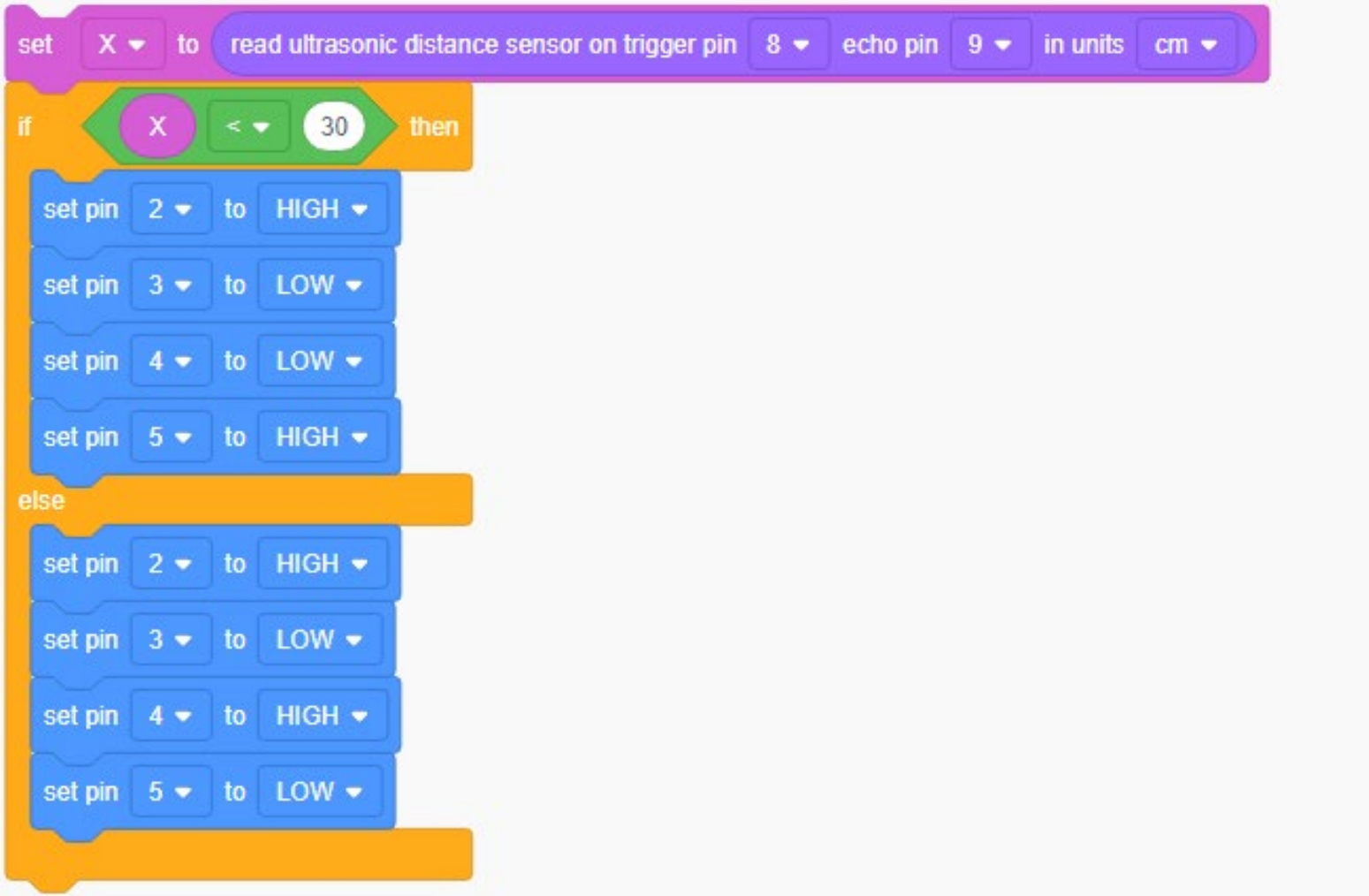
OBSTACLE AVOIDING ROBOT SCRATCH PROGRAM WITHOUT SPEED CONTROL WITHOUT ACCURATE TURNING [SIMPLIFIED ROBOT]


set X to read ultrasonic distance sensor on trigger pin 8 echo pin 9 in units cm
if X < 30 then
set pin 2 to HIGH
set pin 3 to LOW
set pin 4 to LOW
set pin 5 to LOW
else
set pin 2 to HIGH
set pin 3 to LOW
set pin 4 to HIGH
set pin 5 to LOW

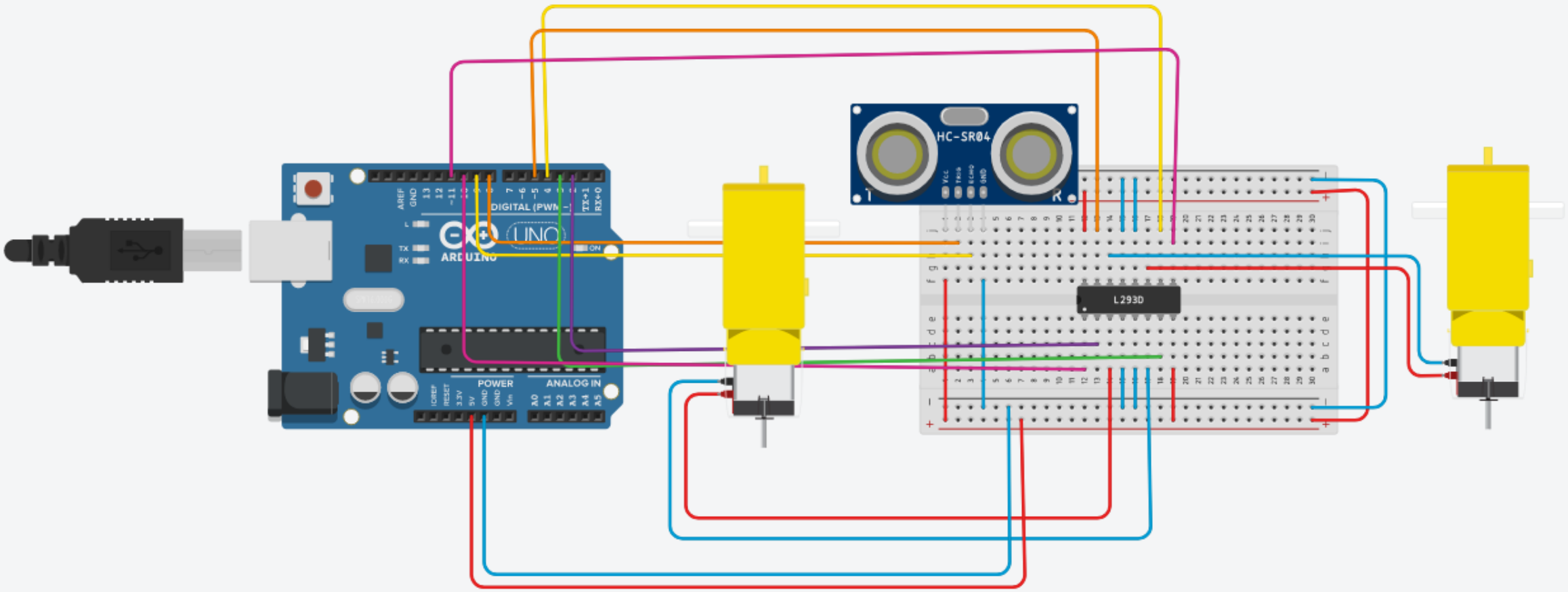
OBSTACLE AVOIDING ROBOT WITHOUT SPEED CONTROL WITH ACCURATE TURNING



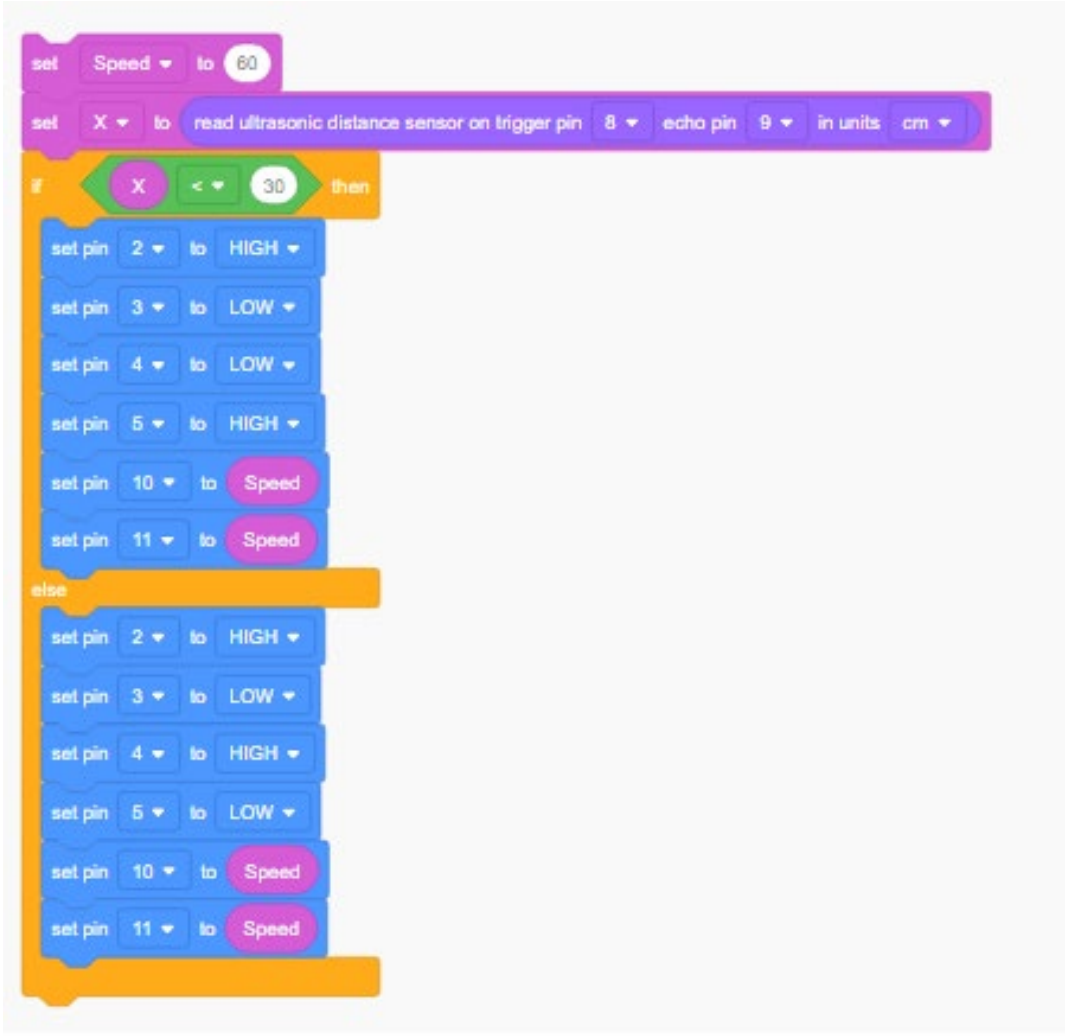
OBSTACLE AVOIDING ROBOT SCRATCH PROGRAM WITHOUT SPEED CONTROL WITH ACCURATE TURNING


set X to read ultrasonic distance sensor on trigger pin 8 echo pin 9 in units cm
if X < 30 then
set pin 2 to HIGH
set pin 3 to LOW
set pin 4 to LOW
set pin 5 to HIGH
else
set pin 2 to HIGH
set pin 3 to LOW
set pin 4 to HIGH
set pin 5 to LOW

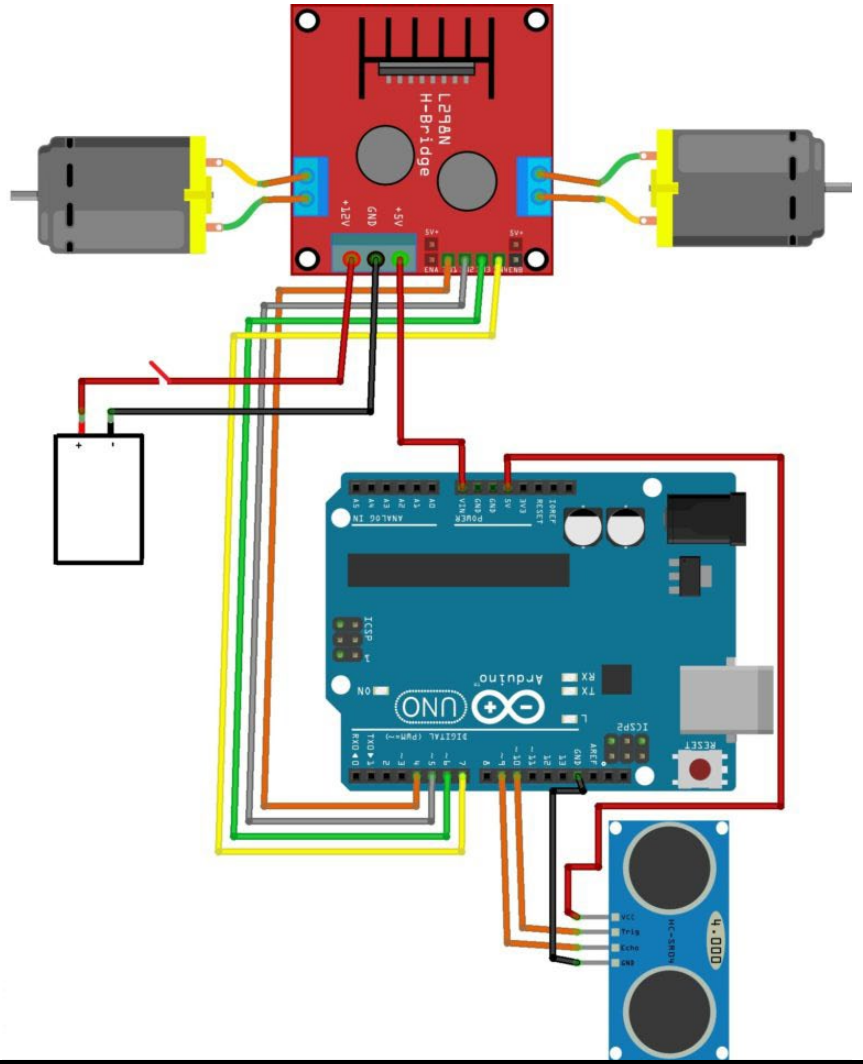
OBSTACLE AVOIDING ROBOT WITHOUT SPEED CONTROL WITH ACCURATE TURNING



OBSTACLE AVOIDING ROBOT SCRATCH PROGRAM WITHOUT SPEED CONTROL WITH ACCURATE TURNING


set Speed to 60
set X to read ultrasonic distance sensor on trigger pin 8 echo pin 9 in units cm
if X < 30 then
set pin 2 to HIGH
set pin 3 to LOW
set pin 4 to LOW
set pin 5 to HIGH
set pin 10 to Speed
set pin 11 to Speed
else
set pin 2 to HIGH
set pin 3 to LOW
set pin 4 to HIGH
set pin 5 to LOW
set pin 10 to Speed
set pin 11 to Speed

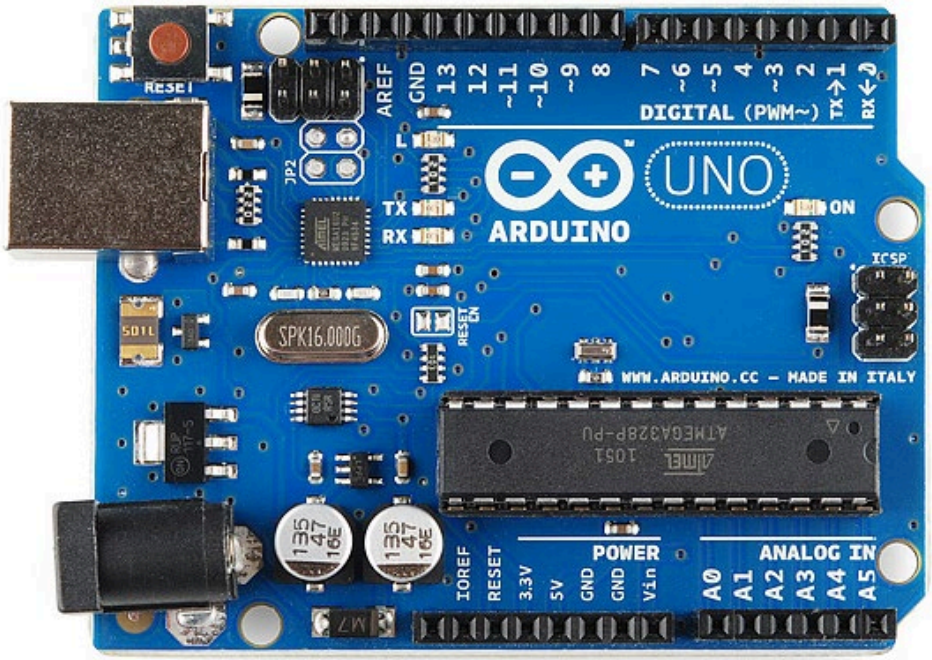
OBSTACLE AVOIDING ROBOT - ACTUAL DIAGRAM

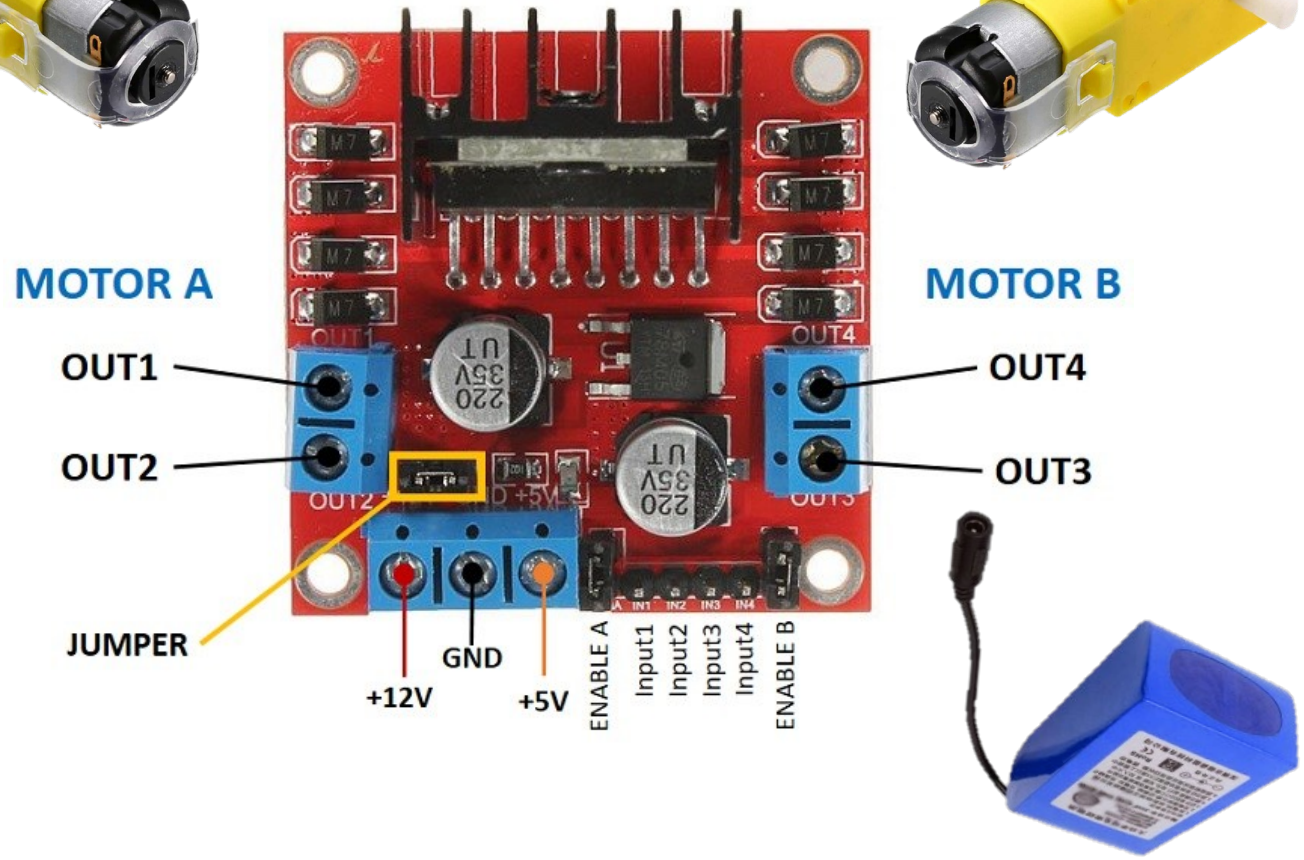


L298N MOTOR CONTROLLER TABLE – EXTENDED FOR ACCURACY

Oparation	Description	Input 1	Input 2	Input 3	Input 4
Move Forward	Both motors should rotate in forward direction	HIGH	LOW	HIGH	LOW
Move Backward	Both Motors should rotate in backward direction	LOW	HIGH	LOW	HIGH
Turn Right	Left motor should rotate in forward direction while the right motor is stopped.	HIGH	LOW	LOW	LOW
Turn Left	Right motor should rotate in forward direction while the left motor is stopped.	LOW	LOW	HIGH	LOW
Stop	Both motors should be stopped.	LOW	LOW	LOW	LOW
Accurate Right Turn	Left Motor should rotate in forward direction while the right motor is rotating in backward direction	HIGH	LOW	LOW	HIGH
Accurate Left Turn	The right motor should rotate in forward direction while the left motor is rotating in backward direction	LOW	HIGH	HIGH	LOW

ACTIVITY: COMPLETE THE WIRING DIAGRAM OF OBSTACLE AVOIDING ROBOT





COMPLETE WIRING DIAGRAM OF OBSTACLE AVOIDING ROBOT